

**The Second Century of Flight: Technology
Challenges and Opportunities**

**Breakout Session #9
What is the Future of Space Exploration?**

**Introductory Remarks
Alan Ladwig**

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Welcome to the panel that will answer the question that has vexed this community for decades – What is the future of Space Exploration?

I'm Alan Ladwig, your moderator. I'm currently the Chief Operating Officer of the Zero Gravity Corporation (ZERO-G), the company that will soon offer you the opportunity to experience weightlessness on our Boeing 727 parabolic flights.

With concurrent sessions, you had a choice of panels to attend and we thank you for choosing us. Not only are we going to be the most informative session, but we're also the best looking panel.

The charge to this panel was as follows:

“History has shown that extraordinary technology challenges with an associated demonstration can be successful in fundamentally changing the world. Is there something that could or should be proposed to make us a true spacefaring nation?”

This charter immediately poses an interesting question: What constitutes a spacefaring nation?

Would implementation of the current NASA Strategic Plan do it?

Can we be spacefaring without sending humans beyond Earth's orbit?

Can we be truly a spacefaring nation if only a handful of government employees get the opportunity to experience space flight?

Can we be a spacefaring nation with limited space transportation capabilities that still costs \$10,000 per pound?

You'd have to be a supreme fortuneteller to accurately predict what the future of space exploration will be – and on some days, could be. The future of this endeavor is influenced by many variables outside of our control, such as the state of the economy; the availability of a sufficient budgets; public interest; political leadership; and national will. These factors are dynamic and difficult to forecast.

In addition to these, we are dealing with the aftermath of the Columbia accident and a multitude of questions and concerns about NASA's basic abilities to perform its mission.

To help us gaze into the crystal ball, we have a terrific panel members who are engaged daily in finding answers to our basic charge.

We will begin with Bruce Mahone, Director of Space Policy for the Aerospace Industries Association (AIA). In this capacity, Bruce provides congress, Federal agencies, with an authoritative source for policy guidance on domestic and international space issues. He will

describe the important contributions aerospace research and development makes to the Nation and to the economy.

Will then hear from Gary Martin, NASA's Space Architect. Gary seems to be the man that everyone wants to meet with. As NASA's Architect, he sets the technology requirements and monitors development program to ensure systems will be ready when needed to support the next-generation science objective.

Peter Diamandis was not able to join us today, but we'll hear from him via videotape as he describes an innovative approach to space transportation -- the X-Prize. I will also say a few words about this competition where the contestants are working to give the rest of us a chance to experience a glimpse of space travel. It's painfully obvious that NASA doesn't care to address space tourism, so here's a look a group of entrepreneurs who do care.

Finally, Roger Launius, the Chair of the Division of Space History at the National Air and Space Museum, will provide a historical perspective and describe his view of the core challenges for spaceflight in the 21st Century.

In the months since the Columbia accident, the embers of a national debate may be starting to glow. In Congress and editorials, questions are being asked and opinions given regarding the future direction of space. Issues are raised such as:

Is human space exploration worth the risk of human life?

Should more resources be directed to space science so that an armada of robots and telescopes can search for life throughout the Universe?

Does NASA produce science that matters?

Are investments in NASA worth the cost?

The emerging debate is also being fueled with hysterics about the new "China Syndrome." The shadow of a Chinese astronaut looms large. They've yet to launch a single human into space, but we're already hearing that they'll be on the Moon within a decade, tramping around Neil Armstrong's footprints..

The debate is especially influenced by the discussion of space transportation.

Can we make the shuttle system safer?

Do we really intend to fly the shuttle until 2020?

What kind of vehicle should we build to send humans into space?

Can we develop a vehicle or vehicles that are cheaper, more robust, more reliable, and take less than 20,000 to operate?

Will our future be constrained with out nuclear propulsion?

Through all discussions on priorities for the future, remember the McElwain Mandate, "If you can't break gravity, you ain't got shit!"

The debate also frequently mentions the need for a stirring vision. But whose vision will suffice?

Should we go back and adopt the celebrated vision of the National Commission on Space that came our in 1986? It called for everything that space advocates long for: a

call to advance science; explore, prospect and *settle* the solar system; space enterprise; a highway to space; a bridge between worlds; and a phased economic approach that could make it all possible.

How about the vision of George Bush senior when he called for completing the International Space Station; a return to the Moon – this time to stay; and sending humans to Mars. His son doesn't seem to be doing much to advance this vision.

Or what about a vision outlined by Bob Bieglow, the Las Vegas hotel icon who looks to space as an arena for five-star resorts and luxury destinations for space tourism.

The trouble with the future that NASA has promoted over the past few decades is that its vision is vast, but it doesn't include many people and it doesn't address the broad range of normal human endeavors. Another problem is that the public is never asked to participate in a discussion of what the vision ought to be.

Finally, do we have the right organization and strategy to realize the full potential of space? It's worth remembering that at the age of 42, the National Advisory Committee on Aeronautics (NACA), was not viewed as the right organization to lead the Nation into the Space Age. At the age of 45, is NASA still the right organization to blaze a trail into the 21st Century?

Let's see what our panelist have to say about these and other issues.